Leading with Leading Indicators

Steve Prevette, Statistician

Tim Carter, V.P. Safety and Health

Fluor Hanford

http://www.hanford.gov/safety/vpp/trend.htm

509-373-9371

Steven_s_prevette@rl.gov

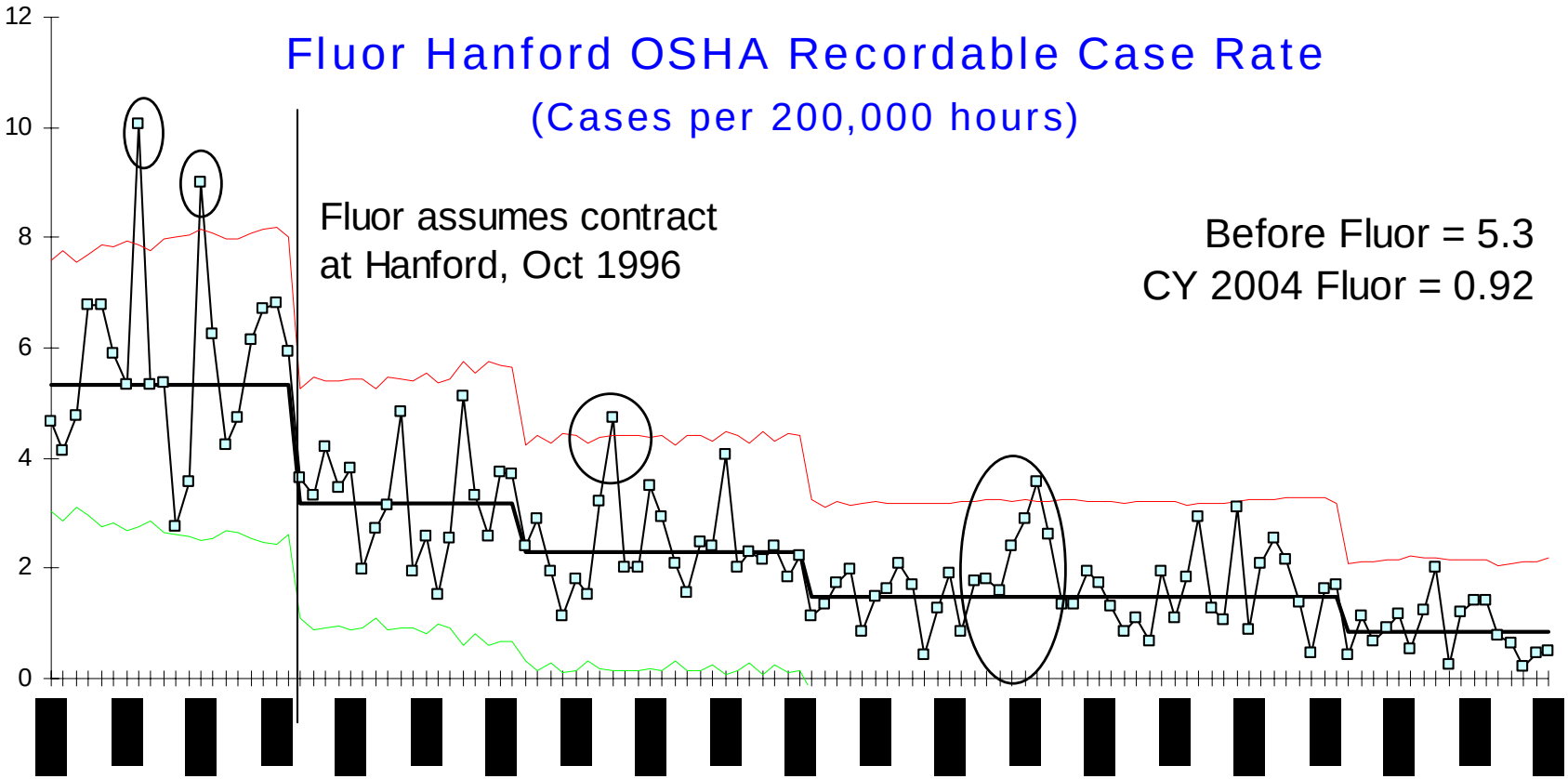
FLUOR®

Introduction

- Fluor Hanford makes use of leading indicators and statistical methodology to assist in safety
- We have achieved significant safety improvements – 84% reduction in OSHA case rate from 1996 to 2005
- Use of leading indicators has correlated to a 30% reduction in OSHA case rate over past 18 months

FLUOR®

Results


Fluor Hanford OSHA Recordable Case Rate
(Cases per 200,000 hours)
Fluor assumes contract at Hanford, Oct 1996
Before Fluor = 5.3
CY 2004 Fluor = 0.92
12
10
8
6
4
2
0

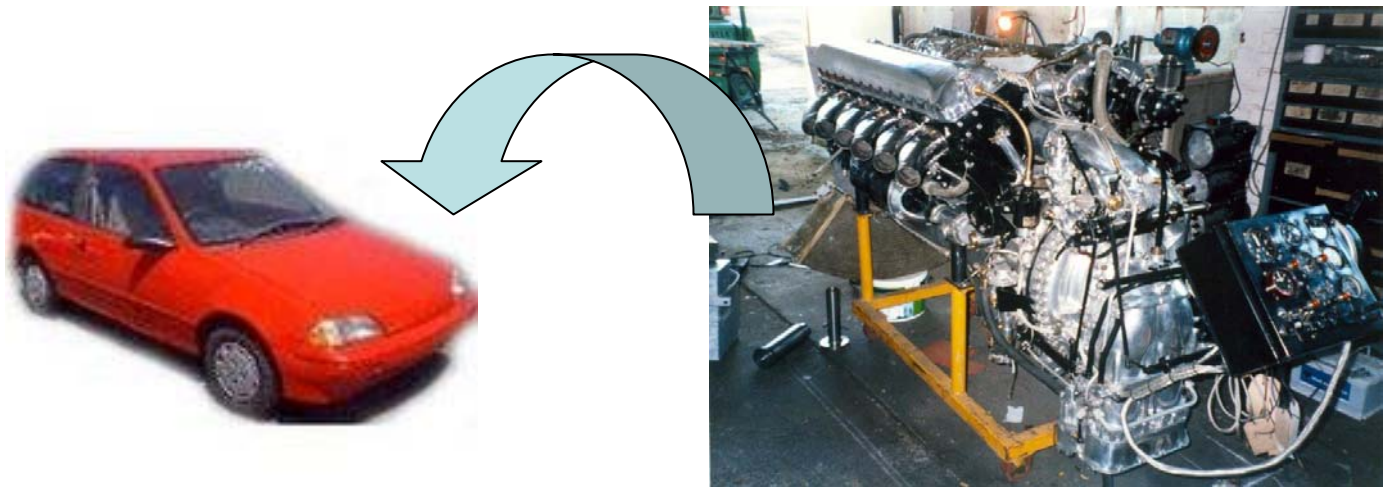
Performance Indicators and Lessons Learned Are Part of a System

- Indicators about Lessons Learned activities
- Lessons Learned as a result of Indicators
- Indicators as a result of Lessons Learned
- Indicators tend to be quantitative, Lessons Learned qualitative
- Are both sources of data for management decision making

FLUOR®

Systems Thinking

Would putting a Rolls-Royce engine in a Geo Metro make an improved automobile?



Nothing wrong with either, but the combination probably won't work (Russ Ackoff)

Jump Start with Leading Indicators

- Just what are leading indicators, anyway?

Predictions of future?

or

A means to create a better future?

FLUOR®

Creating a Better Future

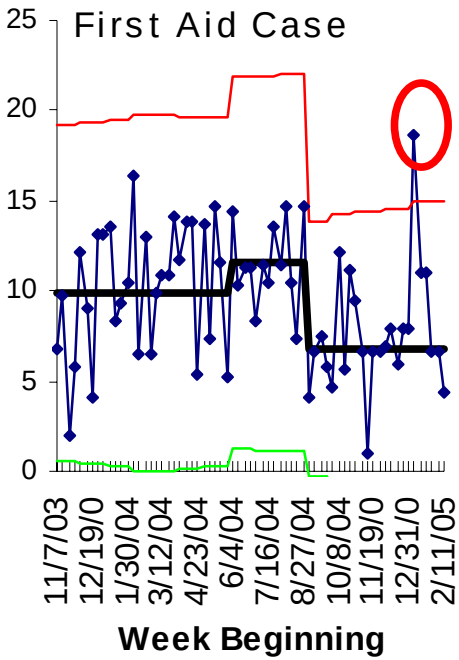
We have gotten distracted by calls to predict future, delaying development of leading indicators

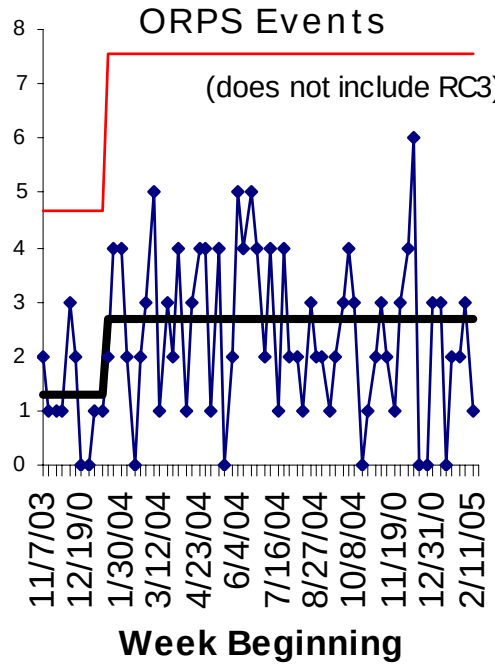
- At a low injury rate, little information exists in the outcome indicators
- Trending response time long at these low rates
- Use leading indicators to measure lower threshold data and activities
- Quickens trend response, reduces injuries and improves outcomes
- Moves management focus forward toward prevention

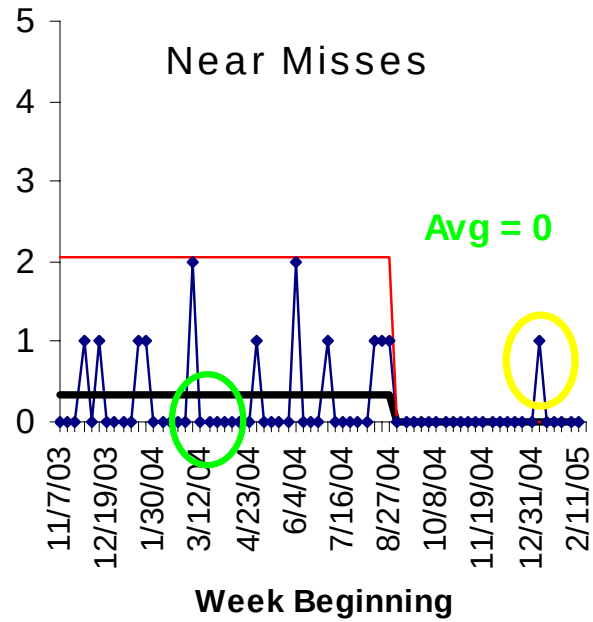
Our Current Leading Indicators

- Events - First Aid Cases, Occurrences, Near Misses
- Safety Inspections - Number and Score
- Employee Input – Safety Concerns and Survey Responses
- This list has changed, and will likely change as the need arises.
- Statistical Process Control (SPC) is used.

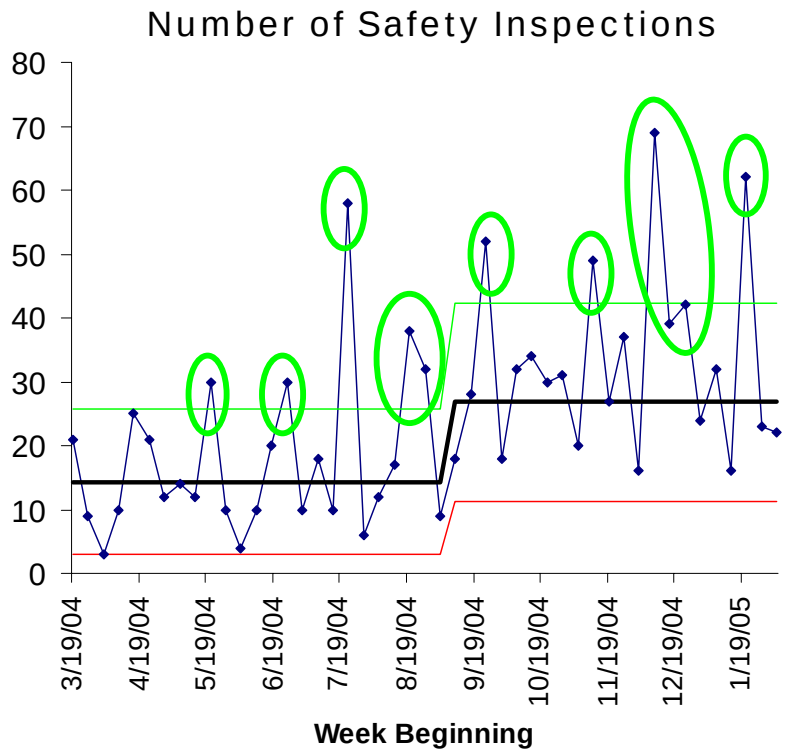
Events

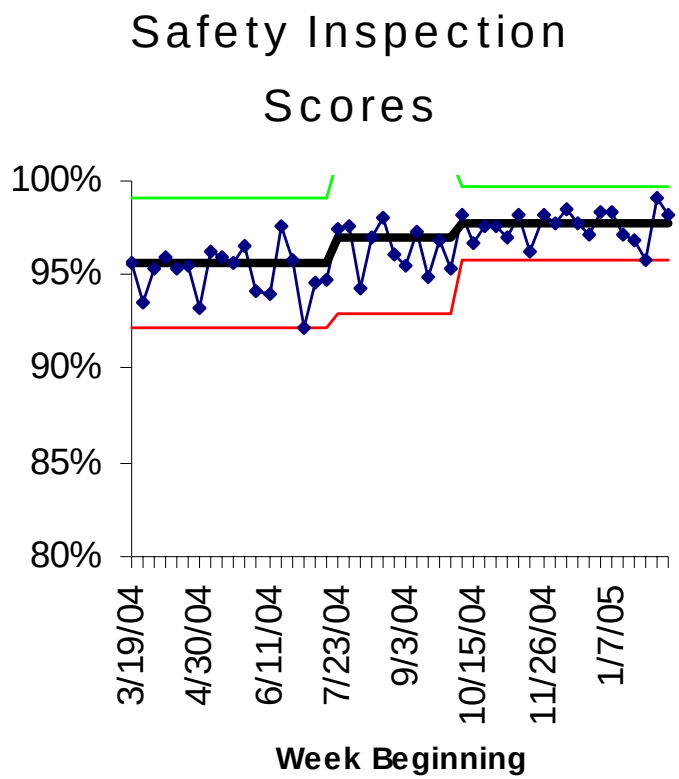

First Aid Case
25
20
15
10
5
0
11/7/03
12/19/0
1/30/04
3/12/04
4/23/04
6/4/04
7/16/04
8/27/04
10/8/04
11/19/0
12/31/0
2/11/05
Week Beginning


ORPS Events
(does not include RC3)
8
7
6
5
4
3
2
1
0
11/7/03
12/19/0
1/30/04
3/12/04
4/23/04
6/4/04
7/16/04
8/27/04
10/8/04
11/19/0
12/31/0
2/11/05
Week Beginning

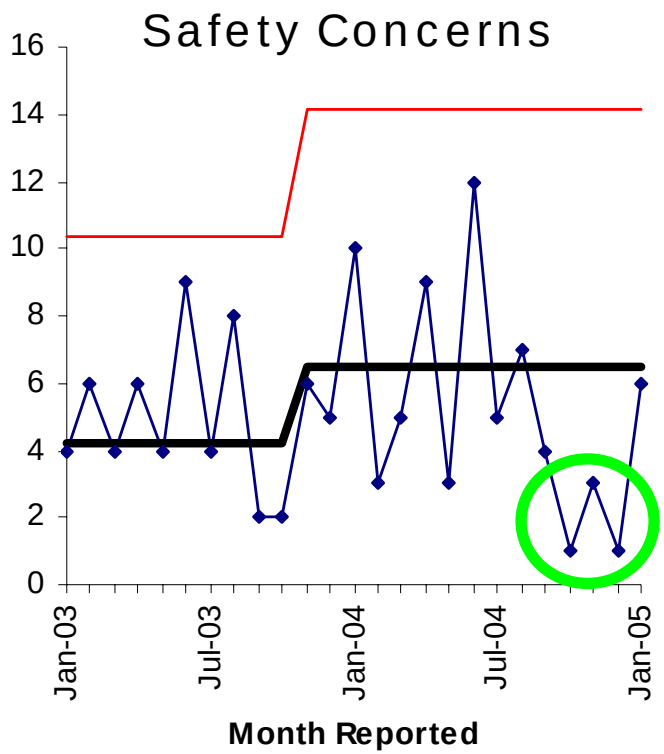

Near Misses
Avg = 0
5
4
3
2
1
0
11/7/03
12/19/03
1/30/04
3/12/04
4/23/04
6/4/04
7/16/04
8/27/04
10/8/04
11/19/04
12/31/04
2/11/05
Week Beginning

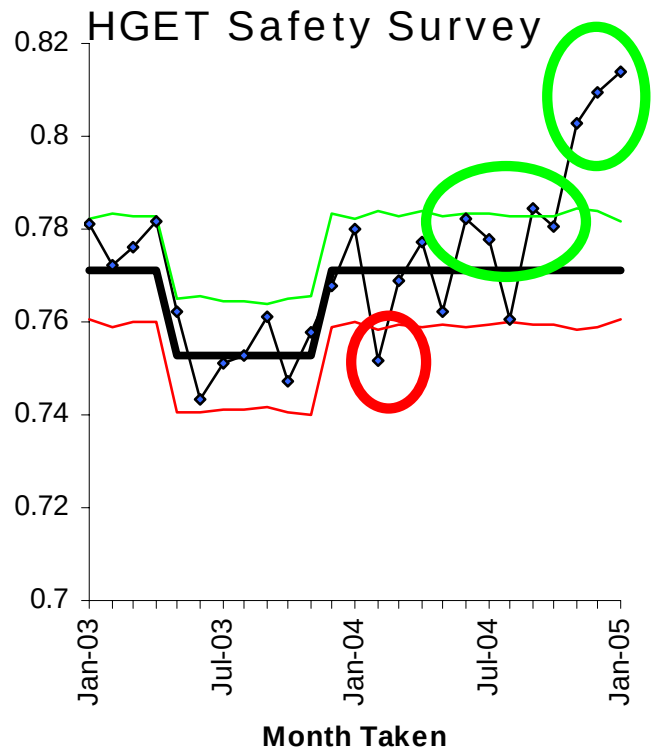
Safety Inspections





Employee Sentiment



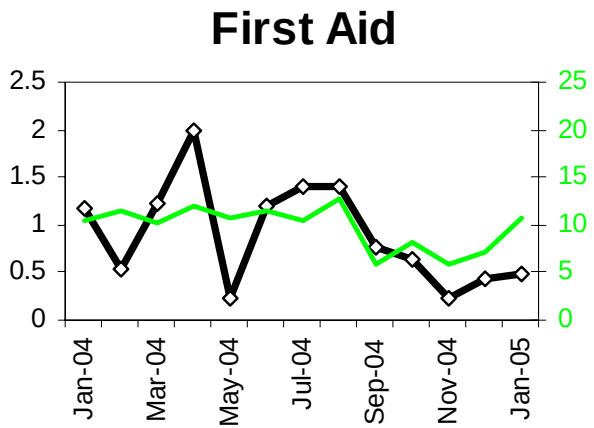


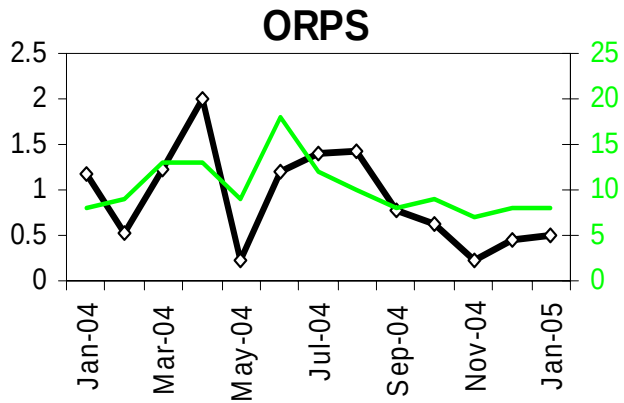
Results

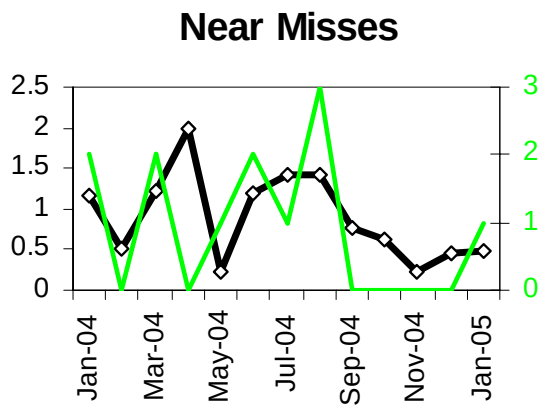
- Five of the Seven Injury and Illness Leading Indicators showing significant improving trends
- OSHA Recordable Case Rate has dropped 30% since start of use (Aug 03 – Apr 04 compared to May 04 – Jan 05)
- Allows focus on doing the right things right

FLUOR®

Correlations



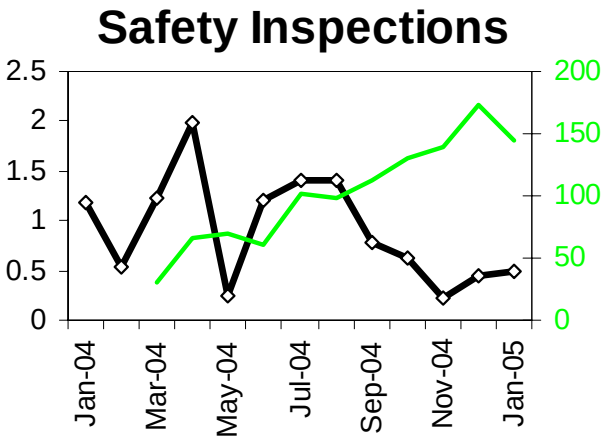


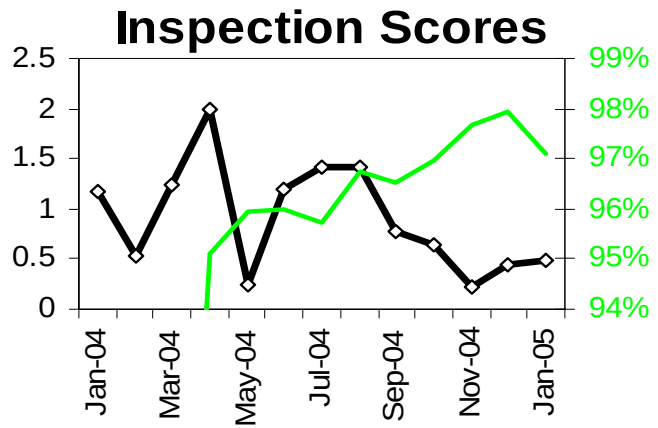


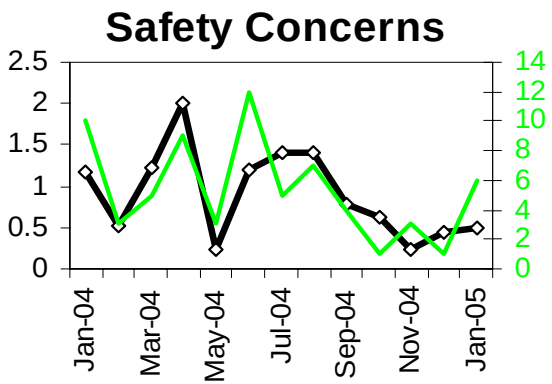
Note: Black line is OSHA Case Rate, Green line is the Leading Indicators

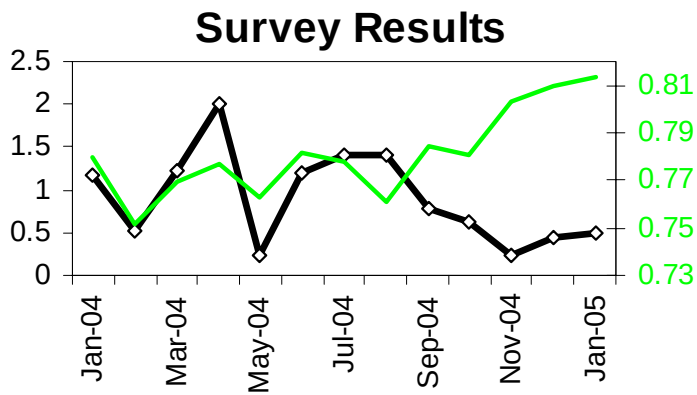
FLUOR®

Correlations









Developing Your Indicators

- Measures of Discipline (work process / planning)
- Measures of Potential (near miss / first aid)
- Measures of Background Noise (non-injury events)
- Indicators of Employee Morale / Satisfaction / Concern
- Prevention Activities (inspections / assessments)
- Level of Effort (time / money devoted to safety and health activities)
- Management Visibility.

FLUOR®

Leadership is Needed

- Charts will help characterize the data.
- Many times the data “will cry out” for action to be taken.
- Leaders at all levels in the corporation must be willing to hear the cry, formulate the appropriate action, take the action, and determine the effect of the action.

FLUOR®

A Color-Coded Dashboard

- Integrated presentation
- Combines the best of “balanced scorecard” with Statistical Process Control trending
- Better than rolling all data into one index
- Allows a Systems Approach

FLUOR®

Common Trending Errors

Error	Typical Behavior	Reaction	Action
Reacting to Ups and Downs (False Alarms)	Comparisons point to point, to average, to last year	Tampering and knee jerk reactions, frustration	When stable, work on long term history, fix the system
Failure to detect trend	No criteria to separate trend from noise	Molehill grows into mountain	Use SPC to detect trends accurately and in time

FLUOR®

Red Yellow and Green

Control Chart Result	Decision	Color	Leadership Action
Stable	Level is Acceptable	Green	Stay the Course
	Level is Not Acceptable	Yellow	Improve System
Trend	Adverse	Red	Corrective Action
	Improving	Green	Reinforce – Stay the Course

Use of "White"

Addition of White to the dashboard can be advantageous:

- Use for one month away from a trend
- Use for stable at an okay level, but not superior
- Minimizes some of the push to be "All Green" while allowing for opportunities for improvement

FLUOR®

Fluor Hanford Dashboard: Safety and Health - OS&H

Indicator (with link to definition)	FH Overall	PFP	K Basins	FFTF	WS&D	SW/GWVZ + WSCF	CP D&D & RCC	CS&I
LEADING INJURY INDICATORS	**W**	**W**	**G**	**G**	**G**	**W**	**G**	**W**
First Aid Case Rate	**Y**	W	Y	W	G	W	G	Y
ORPS	**W**	W	G	W	W	W	W	W
Near Misses	**G**	W	W	G	G	Y	G	G
No. Safety Inspections	**G**	W	W	G	G	W	W	G
Safety Inspection Scores	**G**	G	G	G	W	W	G	G
HGET Survey	**G**	R	G	G	G	W	G	G
Safety Related Employee Concerns	**W**	W	G	G	G	W	G	R
LAGGING INJURY INDICATORS	**W**	**G**	**W**	**G**	**W**	**G**	**W**	**Y**
OSHA Case Rate	**W**	G	W	W	Y	G	Y	Y
DAFW Case Rate	**W**	W	G	G	G	G	G	W
DART Case Rate	**Y**	G	W	G	W	W	W	Y
Severity Rate	**W**	G	W	G	G	G	G	W

Conclusion

- Tools and methodologies such as
  - Statistical Process Control,
  - Systems Thinking,
  - Surveys,
  - Lessons Learned,
  - and Leading indicators,

FLUOR®

- Can provide insight for decision making

Conclusion

- Leading Indicators provide insight and focus for leaders
- Leading Indicators and Lessons Learned could make a very good marriage
- Allows managers, workers, and safety professionals work towards one future, to build the future
- Moves management focus forward toward prevention

FLUOR®